Interagency Agreement # 2022-NASA-NESDIS-Libera-Cooperation

Between
the National Oceanic and Atmospheric Administration / National Environmental Satellite, Data, and Information Service

and

the National Aeronautics and Space Administration / Science Mission Directorate

for Cooperation Relating to

the Accommodation of Libera on Joint Polar Satellite System - 3 (JPSS-3) and its Operation

U.S. Department of Commerce (DOC)
National Oceanic and Atmospheric Administration (NOAA)
National Environmental Satellite, Data, and Information Service (NESDIS)

National Aeronautics and Space Administration (NASA)

ARTICLE 1. AUTHORITY AND PARTIES

The National Aeronautics and Space Administration (NASA), Science Mission Directorate (SMD), located at 300 E Street SW, Washington, DC 20546, enters into this Interagency Agreement (IAA) in accordance with the National Aeronautics and Space Act (51 U.S.C. § 20113-(e)). The National Oceanic and Atmospheric Administration (NOAA), National Environmental Satellite, Data, and Information Service (NESDIS), located at 1335 East-West Highway, Silver Spring, MD 20910, enters into this IAA in accordance with its programmatic authorities, 15 U.S.C. § 313 and 49 U.S.C. § 44720. NASA SMD or NOAA NESDIS may hereinafter be individually referred to as a "Party" and collectively referred to as the "Parties."

ARTICLE 2. PURPOSE

This IAA defines roles and responsibilities for NASA SMD and NOAA NESDIS associated with the accommodation, integration, and testing of Libera, the instrument selection for NASA's Earth Venture Continuity -1 (EVC-1), on NOAA's Joint Polar Satellite System -3 (JPSS-3) satellite, as well as planned Libera operation and data generation responsibilities. The JPSS-3 satellite is scheduled to launch in 2027.

The Joint Polar Satellite System (JPSS) Program, a collaboration between NOAA and NASA based at NASA's Goddard Space Flight Center (GSFC), is providing the nation with next-generation polar-orbiting weather prediction and climate and environmental monitoring capabilities through the development and launch of a series of four satellites. Among other capabilities, JPSS provides uninterrupted continuity of atmosphere, ocean, and land data used in climate modeling and weather forecasting.

Libera, an instrument selected by NASA through the 2018 EVC-1 Earth Science Mission of Opportunity NNH17ZDA004O-EVC1 Announcement of Opportunity (AO), will provide continuity of Earth radiation budget measurements with characteristics similar to previous NASA instruments. Through Libera, NASA will continue to measure this essential climate variable, which is critical for monitoring the Earth's radiation balance.

The NOAA NESDIS Level Requirements document (NESDIS-REQ-1001.1, dated Sept 20, 2020) establishes the following top-level observing requirement: '[REQ-001] NESDIS will provide environmental data, information, products, services and reports in the Foundational, Geophysical and Analytical thematic product areas." The NOAA NESDIS Geophysical Thematic Product Area describes the Earth, atmosphere, and surrounding space environment. Products in the Radiation Budget sub-category include, but are not limited to, all incoming / outgoing radiances and irradiances, reflectance, emissivity, albedo, etc. Libera data will contribute to this NESDIS Level Requirement.

Under this IAA, NASA SMD will implement and develop the Libera mission to baseline interface requirements (e.g., mass, power, thermal, data volume, instrument fields of view)

specified in the JPSS-3 Libera Interface Control Document (ICD), and provide the Libera instrument in accordance with the NOAA JPSS-3 mission schedule. NOAA NESDIS will accommodate the instrument on the JPSS-3 spacecraft in accordance with Articles 3 and 4 of this IAA.

Do No Harm: The Libera instrument will be treated as a "do no harm" addition to the JPSS-3 mission, which includes satellite, ground system, and operations, and will utilize JPSS-3's existing mechanical, electrical, thermal, and data interfaces. This means the Libera instrument shall prevent itself and/or any of its components from propagating failures, damaging, or otherwise degrading the mission performance of the JPSS-3 spacecraft or any of its primary payloads. Further, the JPSS-3 satellite, including the four primary instruments and ground system, will have priority over Libera development, integration, test, and operation. Libera mission development, including planned or actual on-orbit activities, will not add unacceptable cost or risk to JPSS or its ability to meet full system-success criteria. The JPSS Program will retain authority to determine whether risks resulting from the Libera accommodation are acceptable or not.

ARTICLE 3. RESPONSIBILITIES

NASA SMD will use reasonable efforts to:

- Provide the Libera instrument for integration onto the JPSS-3 spacecraft, consistent with the terms in Article 4 of this IAA;
- Provide analysis, integration, and testing, as agreed to by both Parties, required to accommodate Libera on a "do no harm" basis;
- Provide risk mitigations, as agreed to by both Parties, associated with the potential de-manifest of Libera in order to protect JPSS-3 schedule;
- Provide modifications to interfaces or the NOAA-provided mass model as a result of Libera accommodation exceeding the allowances identified in the JPSS-3 Libera ICD;
- Provide for changes in JPSS integration and testing, as agreed to by both Parties, required to address Libera issues and anomalies, if necessary to satisfy Libera mission success;
- Provide post-delivery support for Libera, including satellite integration and test, long-term storage, mission rehearsals, launch, early-orbit checkout, and Libera instrument on-orbit operations;
- Provide Libera instrument management point(s) of contact to JPSS-3 in order to facilitate overall JPSS mission development, including Libera-specific support in the areas of systems engineering, safety and mission assurance, and other aspects of execution necessary for programmatic and technical integration;
- Coordinate efforts to fly the Libera instrument with limited functionality, or in an inert state, if necessary to protect the JPSS-3 mission;
- Provide monthly schedule, technical, and programmatic status and metrics to keep the JPSS Program abreast of Libera mission development and support identification of any risks or impacts to the planned delivery schedule or integration with the JPSS-3 mission;
- Provide Libera major milestone review materials to JPSS, as appropriate;

- Conduct a thorough verification program to demonstrate Libera meets all accommodation requirements and that the as-built / as-flown instrument does no harm to the JPSS-3 mission;
- Provide the Libera instrument operations team;
- Operate the Libera instrument, including instrument activity scheduling and sending operational products, Libera commands and loads to the JPSS-3 Mission Operations team and to the NOAA Satellite Operations Facility (NSOF);
- Perform Libera instrument and data product calibration and validation;
- Conduct long-term monitoring of Libera sensor operation, and support anomaly resolution;
- Distribute Libera and any other required ancillary data from the JPSS-to-Science Data Segment (SDS) Point of Presence (PoP) at the NSOF to the Libera data processing facility;
- Produce, archive, and distribute Libera data products; and
- Notify the JPSS Program of any changes to the Libera mission that could affect JPSS interfaces, operations, or performance, including events, anomalies, failures, and findings.

NOAA NESDIS will use reasonable efforts to:

- Accommodate the Libera instrument on the JPSS-3 spacecraft, consistent with the terms in Article 4 of this IAA;
- Provide detailed technical and programmatic interface and "do no harm" requirements;
- Provide the status of relevant JPSS-3 mission acquisition and development efforts;
- Provide a mass model per the specifications of the JPSS-3 baseline which may be flown if the Libera instrument is not integrated onto the JPSS-3 spacecraft;
- Provide technical management and oversight for the accommodation of Libera onto the JPSS-3 satellite;
- Manage NASA-provided integration of the Libera instrument onto the JPSS-3 spacecraft and execute mutually agreed-to NASA-provided testing to verify that Libera will do no harm to the JPSS-3 mission;
- Provide Command, Control, and Communication and Sustainment services for Libera mission operations;
- Provide appropriate Libera instrument and spacecraft mission data to NASA for its product generation activities, including delivering Level-0 Data consistent with NOAA-NASA data exchange agreements;
- Provide, through the JPSS-to-Science Data Segment (SDS) interface, Libera application packet and raw data records, other instrument science data, and other ancillary data required for NASA data processing; and
- Notify NASA SMD of any changes to JPSS that could affect Libera's interface, operation, or performance, including events, anomalies, failures, and findings.

NASA SMD and NOAA NESDIS will jointly use reasonable efforts to:

- Address any issues related to the Libera instrument delivery and integration schedule with JPSS-3 or to an accelerated JPSS-3 launch date, consistent with the terms in Article 4 of this IAA;
- Coordinate schedules, milestones, and reviews;
- Coordinate an understanding, as agreed to by both Parties, on the appropriate JPSS representation for Libera mission milestone reviews; and
- Identify opportunities for NASA and NOAA to collaborate on the use and application of Libera instrument data to further mutual goals.

ARTICLE 4. SCHEDULE AND MILESTONES

Libera shall be delivered on a timeline that is tied to the JPSS-3 mission milestones as documented in the JPSS Program Integrated Master Schedule (IMS). The JPSS Program IMS evolves over time, and Libera shall be delivered in a manner that does not interfere with or add unacceptable risk to the overall JPSS-3 mission development and launch. If problems occur in Libera development that are projected to impact the planned Libera delivery schedule to the JPSS-3 spacecraft, NASA SMD shall notify NOAA NESDIS within 30 days of their awareness of the schedule change.

Libera considerations shall not drive any JPSS planning or baselined schedules other than to allow for nominal integration to the spacecraft. The JPSS-3 satellite will have been fully qualified and placed in storage prior to Libera availability for integration. A separately and fully qualified Libera will be delivered to the satellite integration facility and integrated following satellite removal from storage. Testing to demonstrate "do no harm" to the JPSS mission will be performed after the planned completion of the JPSS-3 spacecraft integration and test schedule.

The JPSS-3 mission and the associated schedule could evolve to be a gap-filler mission to mitigate a catastrophic loss of space-based weather prediction capability, in which case Libera might not be accommodated on JPSS-3. If Libera cannot meet the JPSS-3 schedule and the instrument has not yet been integrated, NOAA NESDIS may choose to fly a suitable mass model in lieu of the Libera instrument.

In the event NASA SMD misses its milestones for delivery of Libera to the JPSS-3 spacecraft, or the JPSS-3 mission is reprioritized, the NOAA Administrator shall be the sole decision authority for accommodation of Libera on JPSS-3. If Libera is de-manifested from the JPSS-3 mission for any reason, both Parties will begin an orderly close to this IAA.

The planned major milestones for the activities defined in Article 3 of this IAA are to be defined in the JPSS Program configuration-controlled IMS. The dates below for deliveries and Life Cycle Reviews are drawn from the JPSS configuration-controlled IMS and Libera Key Decision Point B (KDP-B) presentation material. The Libera Key Decision Point dates are drawn from the December 2021 Libera IMS. In May 2020, NASA SMD drafted a memo documenting the verbal and email agreements between NASA SMD and NOAA NESDIS to host the Libera

instrument on the JPSS-3 spacecraft. Based on this memo of intent, some work has progressed in advance of IAA approval.

Libera procurement, development, and review schedule:	
EVC-1 Instrument Selection	February 2020 **[complete]**
Authorization to Proceed	July 2020 **[complete]**
System Requirements Review	February 2021 **[complete]**
Key Decision Point – B	May 2021 **[complete]**
Preliminary Design Review	February 2022 **[updated]**
Key Decision Point – C	April 2022 **[updated]**
Critical Design Review	February 2023 **[updated]**
Instrument Integration Review (IIR)	February 2024
Pre-Environmental Review	September 2024
Pre-Ship Review	March 2025
Delivery to Spacecraft	May 2025
Key Decision Point – D	May 2025
Launch	2027
Key Decision Point – E	2027
Post Launch Assessment Review (PLAR)	Launch + 90 days
Operational Transition Review	PLAR + 9 months

JPSS-3 Flight Project schedule milestones:	
JPSS-2/3/4 Critical Design Review (CDR)	October 2017 **[complete]**
JPSS-3 delta Mission Ops Review (MOR)	May 2022
JPSS-3 Systems Integration Review (SIR)	Dec 2022
JPSS-3 delta CDR	June 2023 (est)
JPSS-3 Flight Operations Review	April 2024
JPSS-3 Storage Readiness Date	March 2025
JPSS-3 Operational Readiness Review	September 2027

As development of the JPSS mission progresses, the milestones above will be updated, as required, and additional integration and test milestones will be defined. The agreed-to integration and test milestones will serve as trigger points to comprehensively review Libera and JPSS-3 status, and if necessary, to recommend reconsideration of the decision to accommodate Libera on JPSS-3.

Libera will not be allowed to be the critical path for this mission. If at any time the JPSS Program determines that the accommodation or operation of Libera poses a threat to the JPSS-3 mission, the following procedures shall be followed:

1. The JPSS Director will call for an assessment, in consultation with the NASA SMD Earth Science Division (ESD) Director, to determine whether to a) prevent Libera from being integrated onto the JPSS-3 spacecraft, b) remove Libera from the JPSS spacecraft, or c) fly it in a reduced capability or inert state.
2. NASA SMD ESD shall support any assessment of meaningful threat to the JPSS-3 mission and provide a recommended course of action to the JPSS Director.
3. The JPSS Program will make assessments, evaluating the likelihood and consequences of the risks, utilizing JPSS risk management criteria and processes, quantify the threat, and report a recommendation to the NOAA Administrator, up through the NESDIS Deputy Assistant Administrator for Systems, the NASA Joint Agency Satellite Division Director, the NOAA Assistant Administrator for Satellite and Information Services, and the NASA Associate Administrator for Science.
4. Existing JPSS management decision-making processes and boards will be utilized to vet the assessment and recommendation to the NOAA Administrator.
5. NASA SMD ESD will be represented in these processes, and if consensus is not reached, dissenting opinions will be carried forward by NOAA NESDIS through the boards to the NOAA Administrator as the decision authority.

Once Libera is integrated onto the JPSS-3 spacecraft, any threats to the JPSS-3 mission will likely require resolution on an urgent basis. If so, special board meetings will be called, and, where possible, such boards will be combined to ensure rapid decision-making. Once launch preparations have begun, decision-making will follow launch campaign decision-making processes.

ARTICLE 5. FINANCIAL OBLIGATIONS

There will be no exchange of funds between NASA SMD and NOAA NESDIS with respect to this IAA. Each Agency will fund its own participation as described herein. All activities under or pursuant to this IAA are subject to the availability of funds, and no provision of this IAA shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, (31 U.S.C. § 1341).

ARTICLE 6. PRIORITY OF USE

Any schedule or milestone in this IAA is estimated based upon the Parties' current understanding of the projected availability of its respective goods, services, facilities, or equipment. In the event that either Party's projected availability changes, the other Party shall be given reasonable notice of that change, so that the schedule and milestones may be adjusted

accordingly. The Parties agree that each Party's use of its own goods, services, facilities, or equipment shall have priority over the use planned in this IAA.

ARTICLE 7. LIABILITY AND RISK OF LOSS

The Code of Federal Regulations (14 C.F.R. § 1266.104) establishes a cross-waiver of liability between the parties to agreements for science or space exploration activities unrelated to the International Space Station which involve a launch, and requires that such cross-waiver be flowed down to the parties' related entities. In furtherance of this requirement, the Parties agree to ensure that their respective applicable Related Entities are subject to the cross-waiver as set forth in 14 C.F.R. § 1266.104.

ARTICLE 8. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

The Parties agree that the information and data exchanged in furtherance of the activities under this IAA will be exchanged without use and disclosure restrictions unless required by national security regulations (e.g., classified information) or as otherwise provided in this IAA or agreed to by the Parties for specifically identified information or data (e.g., information or data specifically marked with a restrictive notice).

ARTICLE 9. INTELLECTUAL PROPERTY RIGHTS – INVENTION & PATENT RIGHTS

Unless otherwise agreed upon by the Parties, custody and administration of inventions made (conceived or first actually reduced to practice) under this IAA will remain with the respective inventing Party. In the event an invention is made jointly by employees of the Parties (including by employees of a Party's contractors or subcontractors for which the U.S. Government has ownership), the Parties will consult and agree as to future actions toward establishment of patent protection for the invention.

ARTICLE 10. RELEASE OF GENERAL INFORMATION TO THE PUBLIC AND MEDIA

The Parties may, consistent with Federal law and this IAA, release general information regarding its own participation in this IAA as desired. Insofar as participation of the other Party in this IAA is included in a public release, Parties will seek to consult with each other prior to any such release, consistent with Parties' respective policies.

Pursuant to Section 841(d) of the NASA Transition Authorization Act of 2017, Public Law 115-10 (the "NTAA"), NASA is obligated to publicly disclose copies of all agreements conducted pursuant to NASA's 51 U.S.C. §20113(e) authority in a searchable format on the NASA website within 60 days after the agreement is signed by the Parties. The Parties acknowledge that a copy of this Agreement will be disclosed, without redactions, in accordance with the NTAA.

ARTICLE 11. TERM OF AGREEMENT

This IAA becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect for ten (10) years from the effective date, or until completion of all obligations of both parties hereto, whichever comes first. The parties agree to review the agreement every three years to make sure the terms remain agreeable.

ARTICLE 12. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Agreement by providing one hundred eighty (180) days calendar days written notice to the other Party.

ARTICLE 13. CONTINUING OBLIGATIONS

The rights and obligations of the Parties that, by their nature, would continue beyond the expiration or termination of this Agreement, e.g., "Liability and Risk of Loss" (Article 7) and "Intellectual Property Rights" (Article 8) shall survive such expiration or termination of this Agreement.

ARTICLE 14. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Agreement.

Management Points of Contact:

NASA, Science Mission Directorate

Joint Agency Satellite Division
John Gagosian, Director
300 E Street SW
Washington, DC 20546
202-358-0773
john.s.gagosian@nasa.gov

Earth Science Division
Karen M. St. Germain, Director
300 E Street SW
Washington, DC 20546
202-358-3759
karen.m.stgermain@nasa.gov

NOAA National Environmental
Satellite Data and Information Service

Joint Polar Satellite System Program
Tim Walsh, Program Director (Acting)
7700 Hubble Drive
Lanham, MD 20706
301-938-1761
tim.walsh@noaa.gov

Technical Points of Contact:

Joint Agency Satellite Division
Maura Fujieh, JPSS-3 Program Executive
300 E Street SW
Washington, DC 20546
650-815-6456
maura.fujieh@nasa.gov

Joint Polar Satellite System Program
André Dress, JPSS Flight Project Manager
8800 Greenbelt Rd.
Greenbelt, MD 20771
301-286-5321
andre.dress-1@nasa.gov

Earth Science Division
Amanda Whitehurst, Libera Program Executive
300 E Street SW
Washington, DC
202-358-0234
amanda.s.whitehurst@nasa.gov

ARTICLE 15. DISPUTE RESOLUTION

All disputes concerning questions of fact or law arising under this IAA shall be referred by the claimant in writing to the appropriate person identified in this IAA as the Points of Contact. The persons identified as the Points of Contact for NASA SMD and NOAA NESDIS, respectively, will consult and attempt to resolve all issues arising from the implementation of this IAA. If they are unable to come to agreement on any issue, the dispute will be referred to the signatories to this IAA, or their designees, for joint resolution after the Parties have separately documented in writing clear reasons for the dispute. The NOAA Administrator shall be the sole decision authority for Libera instrument accommodation on JPSS-3.

ARTICLE 16. INVESTIGATIONS OF MISHAPS AND CLOSE CALLS

In the case of a close call, mishap or mission failure, the Parties agree to provide assistance to each other in the conduct of any investigation. For all NASA mishaps or close calls, NOAA NESDIS agrees to comply with NPR 8621.1, "NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping".

ARTICLE 17. MODIFICATIONS

Any modification to this IAA shall be executed, in writing, and signed by an authorized representative of both Parties.

ARTICLE 18. APPLICABLE LAW

U.S. Federal law governs this IAA for all purposes, including, but not limited to, determining the validity of the IAA, the meaning of its provisions, and the rights, obligations, and remedies of the Parties.

ARTICLE 19: SIGNATORY AUTHORITY

Approved and Authorized on Behalf of Each Party by:

National Aeronautics and Space Administration, Science Mission Directorate

By:

Thomas H. Zurbuchen, PhD.
Associate Administrator for the Science Mission Directorate

National Oceanic and Atmospheric Administration, National Environmental Satellite Data and Information Service

By: VOLZ.STEPHEN.MICHAEL.1504223694

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Stephen M. Volz, Ph.D.
Assistant Administrator for Satellite and Information Service